

Amendments to the Claims

Please add new claims 18-37 as set forth in the below listing of the claims. This listing of claims will replace all prior versions, and listings of claims in the application:

1. (Original) Apparatus for modulating the temperature and pressure within a body cavity by means of recirculation of a biological or biocompatible liquid within the cavity, but outside of blood vessels, which comprises: (a) first pump means for infusing liquid at a controlled temperature and flow rate into the cavity; (b) means for monitoring the temperature within the cavity; (c) means for monitoring the pressure within the cavity; and (d) second pump means for withdrawing liquid at a controlled flow rate from the cavity.

2. (Original) Apparatus as claimed in claim 1, additionally comprising a dual lumen catheter insertable into said cavity, one lumen being connected to said first pump means and the second lumen being connected to said second pump means.

3. (Original) Apparatus as claimed in claim 2, comprising a further catheter insertable into said cavity to withdraw liquid from said cavity.

4. (Original) Apparatus as claimed in claim 3, in which said further catheter has associated pump means to withdraw liquid from said cavity.

5. (Original) Apparatus as claimed in claim 3, in which said further catheter has associated flow control means to regulate the flow of liquid from said cavity.

6. (Original) Apparatus as claimed in claim 1, including liquid storage means to receive liquid from said first pump means and to deliver liquid to said second pump means.

7. (Original) Apparatus as claimed in claim 6, comprising a further catheter insertable into said cavity to withdraw liquid from said cavity and in which said liquid storage means also receives liquid from said further catheter.

8. (Original) Apparatus as claimed in claim 6, in which said liquid storage means includes means to oxygenate liquid.

9. (Original) Apparatus as claimed in claim 6, in which said liquid storage means includes means to adjust the pH of the liquid.

10. (Original) Apparatus as claimed in claim 6, in which said liquid storage means includes means to separate contaminants from the liquid by foam fractionation.

11. (Original) Apparatus as claimed in claim 6, additionally comprising control means for at least one said pump means to control the operation of said pump means dependant on the output of said means for monitoring pressure and temperature within the cavity.

12. (Original) Apparatus as claimed in claim 6, additionally comprising: (a) means for monitoring liquid temperature in the liquid storage means; and (b) means for controlling said second pump means to control the operation of said pump means responsive to the difference between the temperature monitored by the means for monitoring the temperature within the cavity and the means for monitoring the liquid temperature in the liquid storage means.

13. (Original) Apparatus as claimed in claim 1, additionally comprising means responsive to the pressure sensed by said pressure monitoring means within the cavity to control operation of said first pump means.

14 - 17. (Canceled)

18. (New) Apparatus for modulating introduction and removal of a liquid within a cavity of a patient's body, the cavity comprising a cavity outside of blood vessels, the apparatus comprising:

a catheter configured for insertion into the cavity and introduction and removal of liquid from the cavity;

one or more sensors positionable in the patient's body so as to sense a condition of liquid in the cavity; and

a controlled pumping system operatively coupled to both the catheter and the one or more sensors, the controlled pumping system configured to control introduction and removal of liquid from the cavity so as to maintain a selected liquid condition value.

19. (New) The apparatus of claim 18, the catheter comprising a first lumen for introducing liquid into the cavity and a second lumen for removing fluid from the cavity.

20. (New) The apparatus of claim 18, wherein the one or more sensors are positioned on the catheter.

21. (New) The apparatus of claim 18, wherein the one or more sensors are positioned separate from the catheter and positionable at a location separate from the catheter.

22. (New) The apparatus of claim 18 wherein the condition is liquid pressure.

23. (New) The apparatus of claim 18 wherein the condition is liquid temperature.

24. (New) The apparatus of claim 18 wherein the catheter comprises a dual lumen catheter.

25. (New) The apparatus of claim 18, further comprising a first receptacle for storing liquid to be introduced into the patient's cavity and a second receptacle for collecting liquid removed from the patient's cavity.

26. (New) The apparatus of claim 25, wherein the first receptacle and second receptacle are coupled so as to allow recirculation of liquid.

27. (New) The apparatus of claim 18 further comprising a second catheter configured for removal of liquid from the cavity.

28. (New) A feedback-controlled apparatus for introduction and removal of a liquid within a cavity of a patient's body, the cavity comprising a cavity outside of blood vessels, the apparatus comprising:

a catheter configured for insertion into the cavity and introduction and removal of liquid from the cavity;

one or more sensors positionable so as to sense a biological parameter of a patient's body; and

a controlled pumping system operatively coupled to both the catheter and the one or more sensors, the controlled pumping system configured to modulate a property of the liquid in response to signals received from the one or more sensors and to maintain the biological parameter of the patient's body within a selected range.

29. (New) The apparatus of claim 28, wherein the property of the liquid comprises rate of introduction or removal from the cavity.

30. (New) The apparatus of claim 28, wherein the property of the liquid comprises contamination level, concentration, oxygenation, pH, or chemical agent or drug content.

31. (New) The apparatus of claim 28 wherein the catheter comprises a dual lumen catheter.

32. (New) A method of maintaining a liquid condition parameter within a body cavity other than a blood vessel within a patient's body, the method comprising:

pumping liquid into the cavity;

pumping liquid out of the cavity;

monitoring a parameter of liquid within the cavity from a sensor disposed within the patient's body; and

controlling at least one of liquid temperature, liquid pressure, and liquid flow rate in response to a liquid condition value measured in the monitoring step.

33. (New) The method of claim 32 wherein the monitoring step comprises monitoring temperature of liquid within the cavity.

34. (New) The method of claim 32 wherein the monitoring step comprises monitoring pressure of liquid within the cavity.

35. (New) The method of claim 32 wherein the steps of pumping liquid into the cavity and pumping liquid out of the cavity comprises pumping liquids into and out of the cavity through a single catheter.

36. (New) The method of claim 35 wherein the catheter comprises a dual lumen catheter.

37. (New) The method of claim 32 wherein the step of pumping liquid out of the cavity comprises pumping liquid out of the cavity through an outflow catheter disposed remote from an inflow catheter through which liquid is pumped into the cavity.